FIG. 1

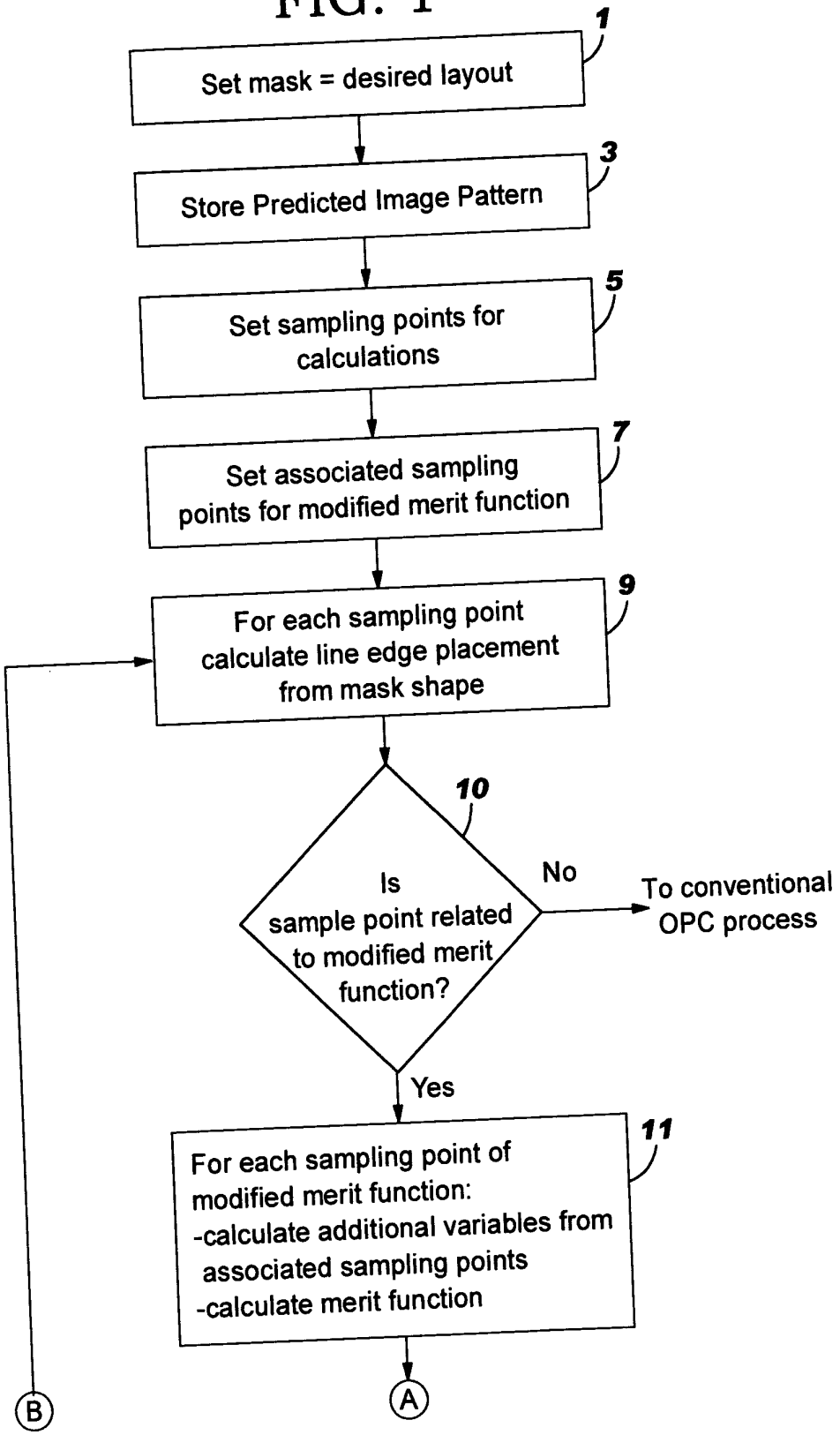

1
Set mask = desired layout
3
Store Predicted Image Pattern
5
Set sampling points for calculations
7
Set associated sampling points for modified merit function
9
For each sampling point calculate line edge placement from mask shape
10
Is sample point related to modified merit function?
No
To conventional OPC process
Yes
11
For each sampling point of modified merit function:
-calculate additional variables from associated sampling points
-calculate merit function
A
B

FIG. 1
(cont'd)

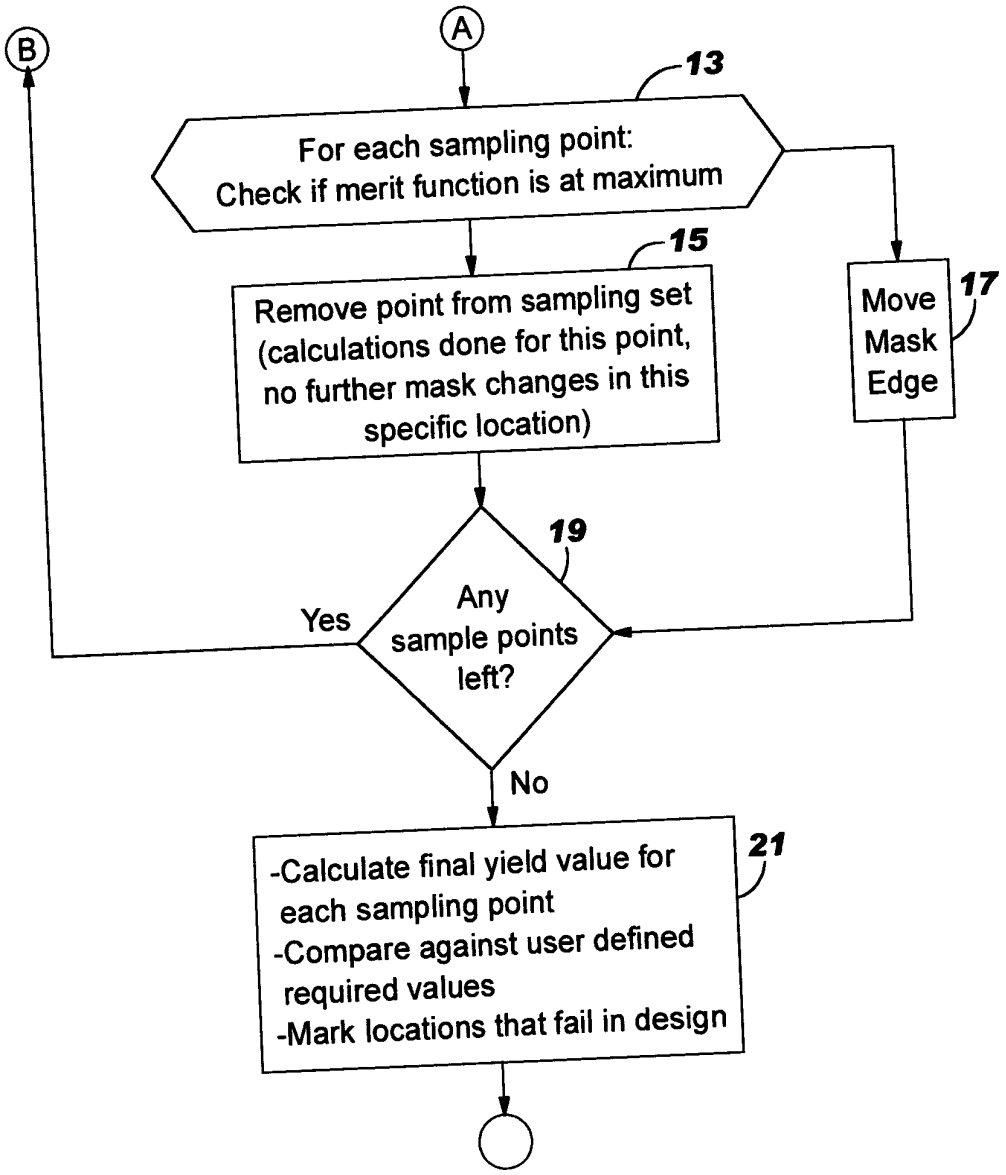

A
B
13
For each sampling point:
Check if merit function is at maximum
15
Remove point from sampling set
(calculations done for this point,
no further mask changes in this
specific location)
17
Move
Mask
Edge
19
Any
sample points
left?
Yes
No
21
-Calculate final yield value for
each sampling point
-Compare against user defined
required values
-Mark locations that fail in design

FIG. 2

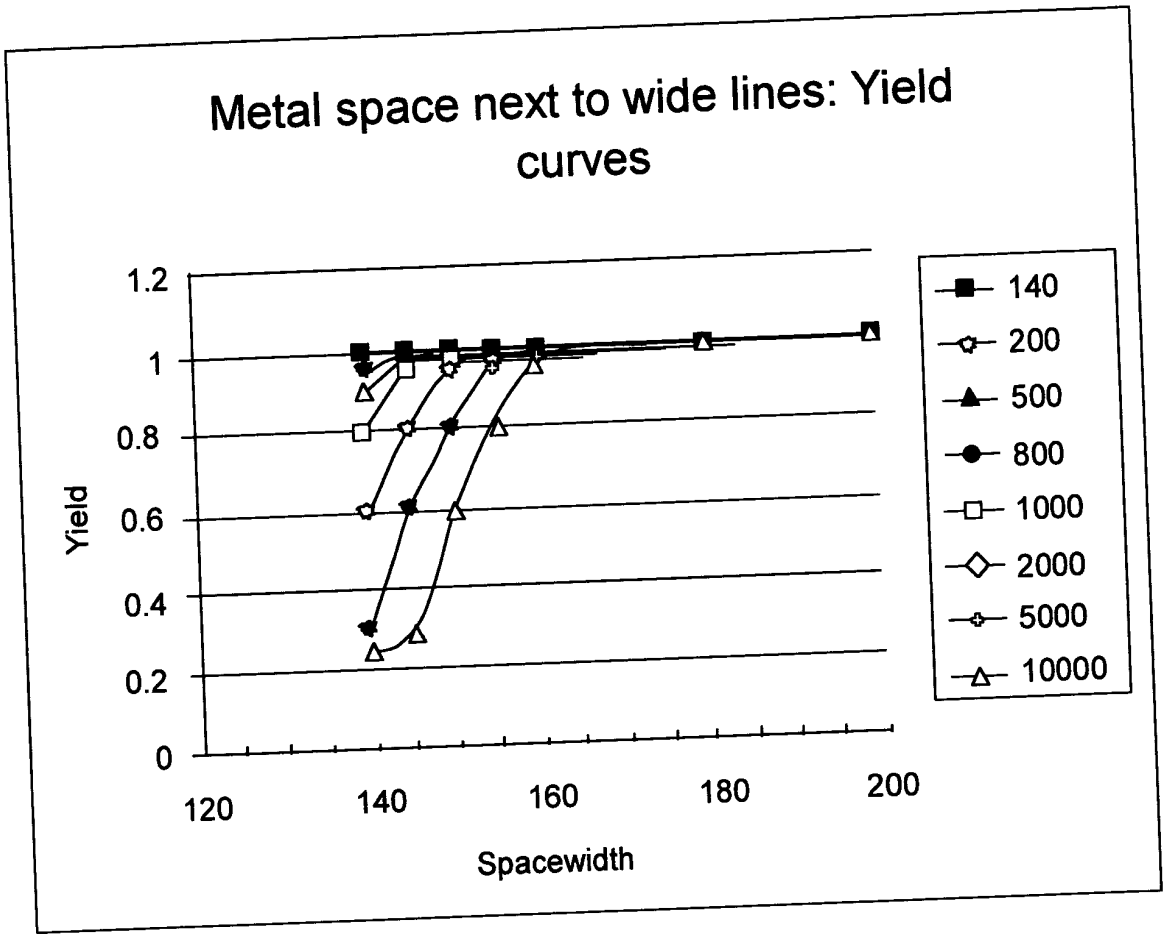

Metal space next to wide lines: Yield curves
Yield
1.2
1
0.8
0.6
0.4
0.2
0
120
140
160
180
200
Spacewidth
140
200
500
800
1000
2000
5000
10000

FIG. 3

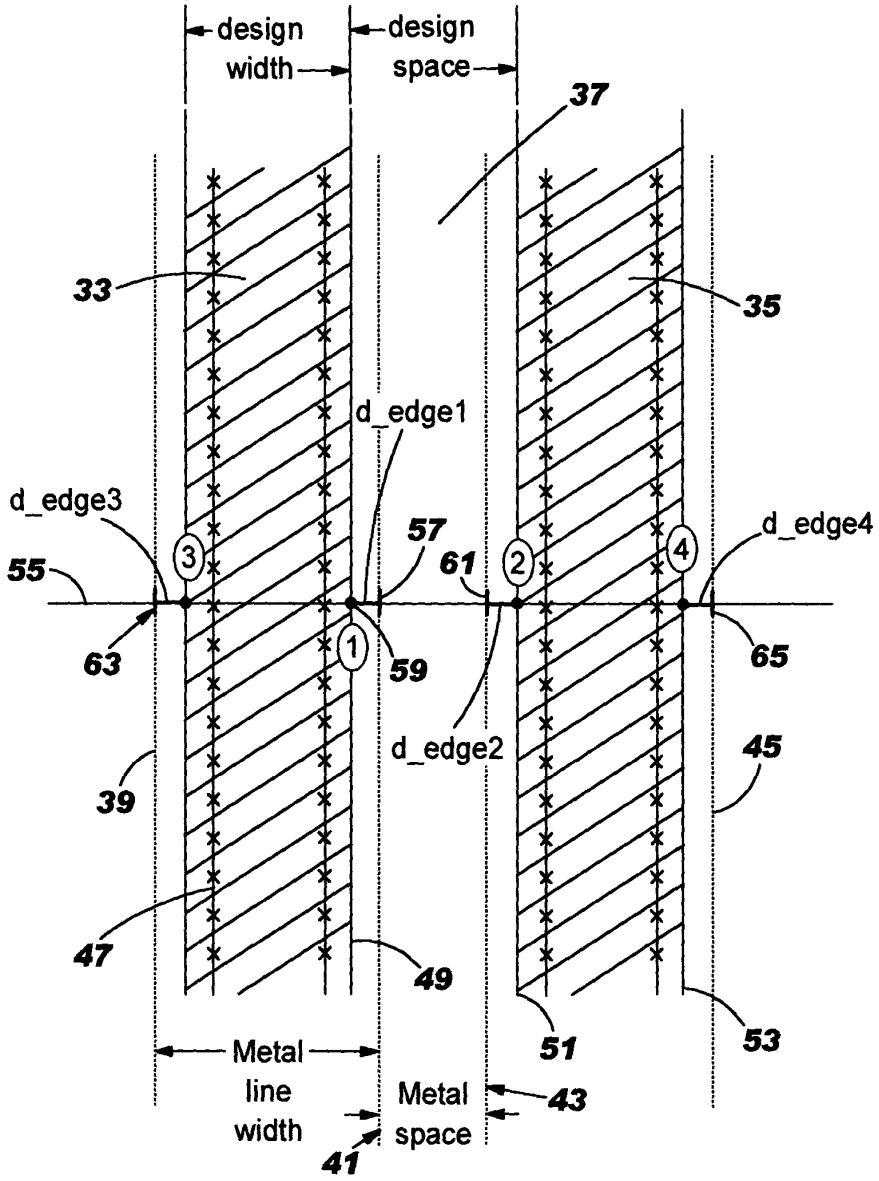

design width
design space
37
33
35
d_edge1
d_edge3
d_edge4
57
55
61
3
2
4
1
63
59
65
d_edge2
45
39
47
49
51
53
Metal line width
Metal space
43
41

FIG. 3A

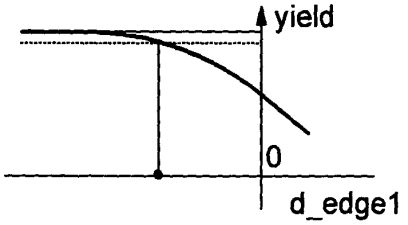

yield
0
d_edge1

FIG. 4

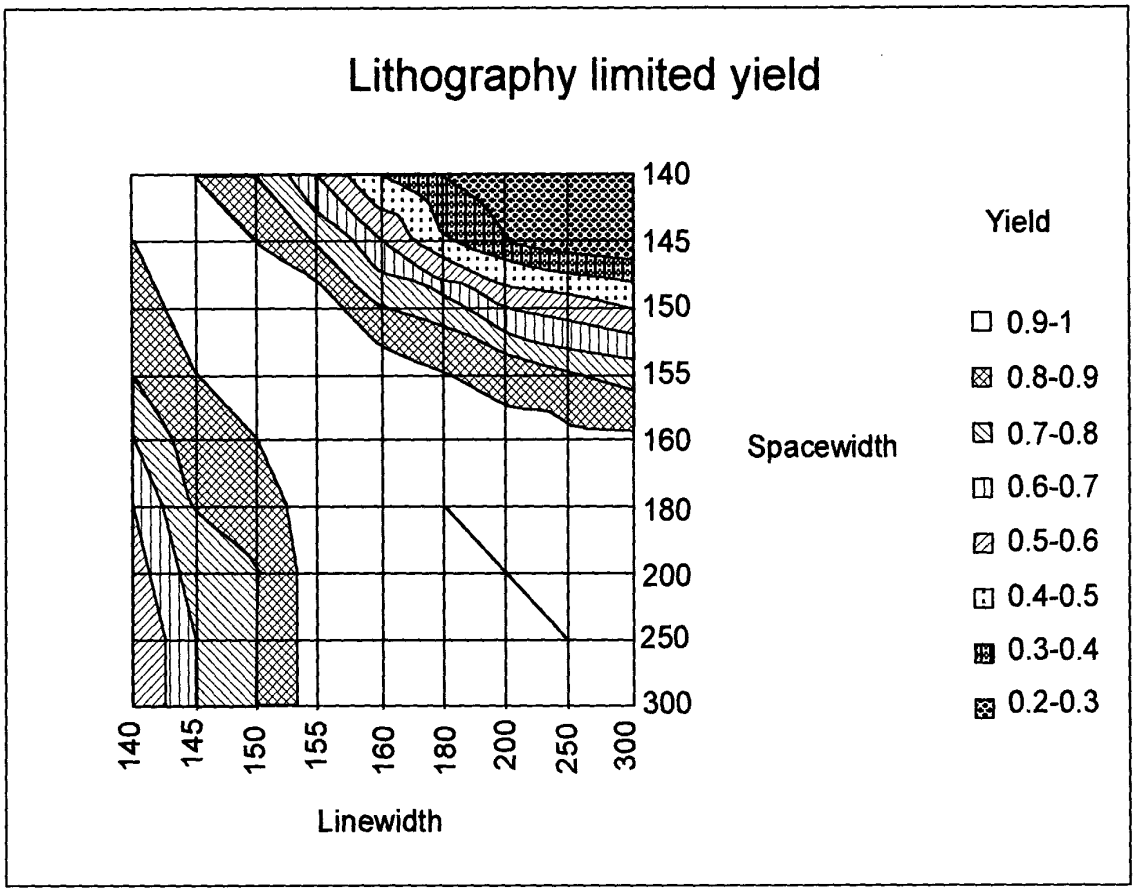

Lithography limited yield
140
145
150
155
160
180
200
250
300
Spacewidth
Linewidth
Yield
0.9-1
0.8-0.9
0.7-0.8
0.6-0.7
0.5-0.6
0.4-0.5
0.3-0.4
0.2-0.3

FIG. 5

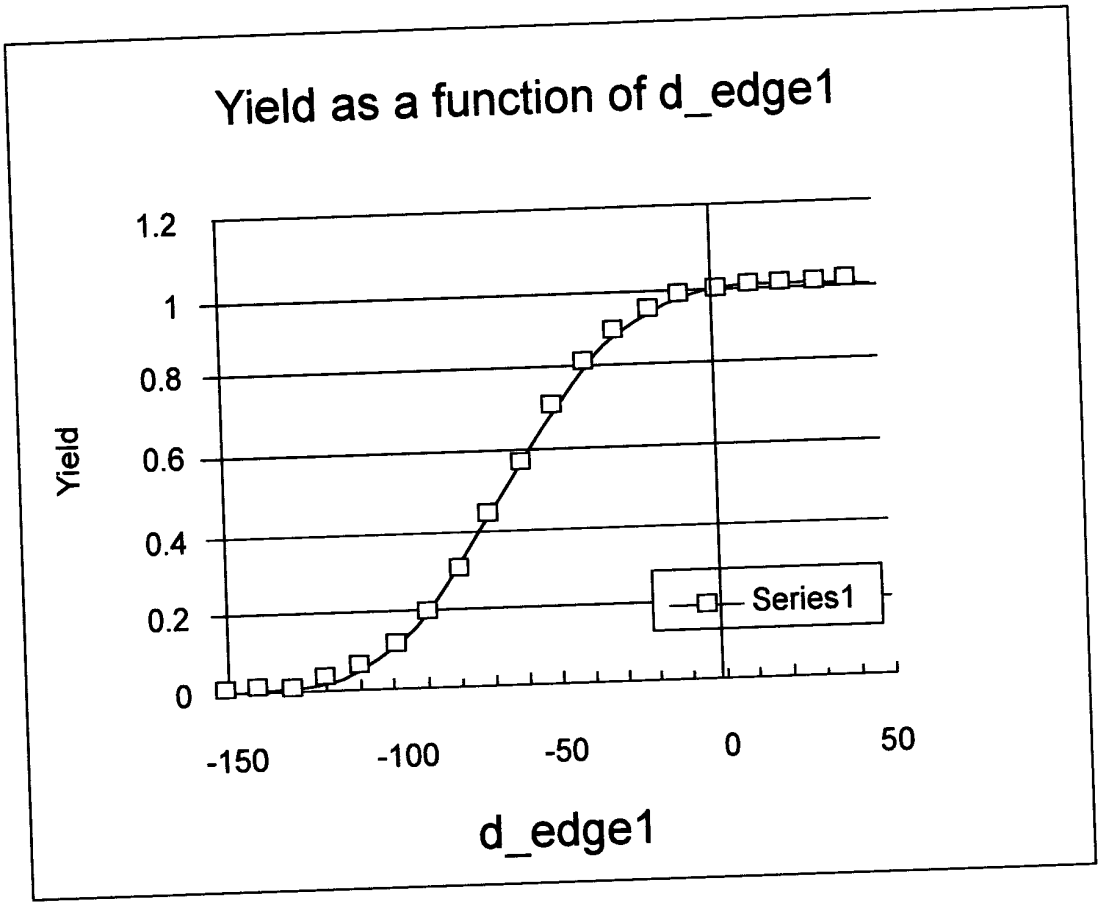

Yield as a function of d_edge1
Yield
1.2
1
0.8
0.6
0.4
0.2
0
-150
-100
-50
0
50
d_edge1
Series1

FIG. 6

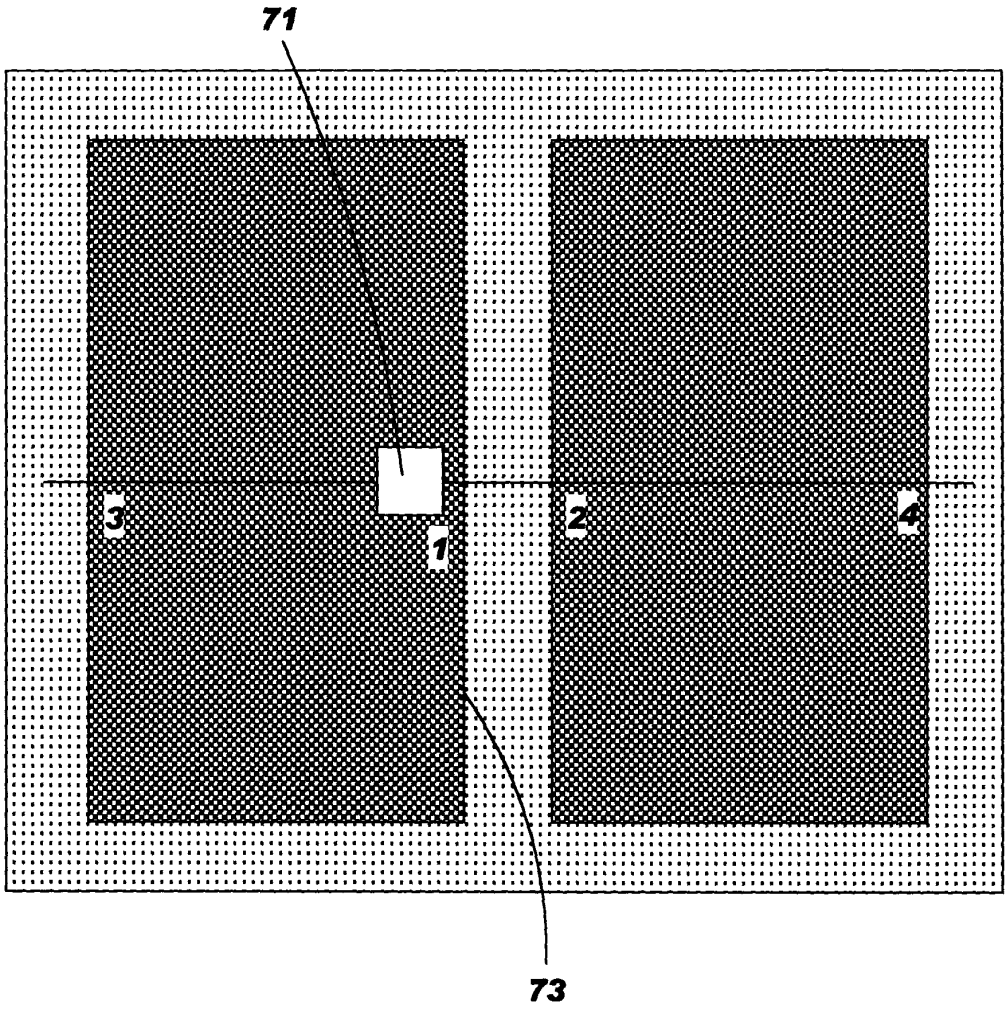


FIG. 7

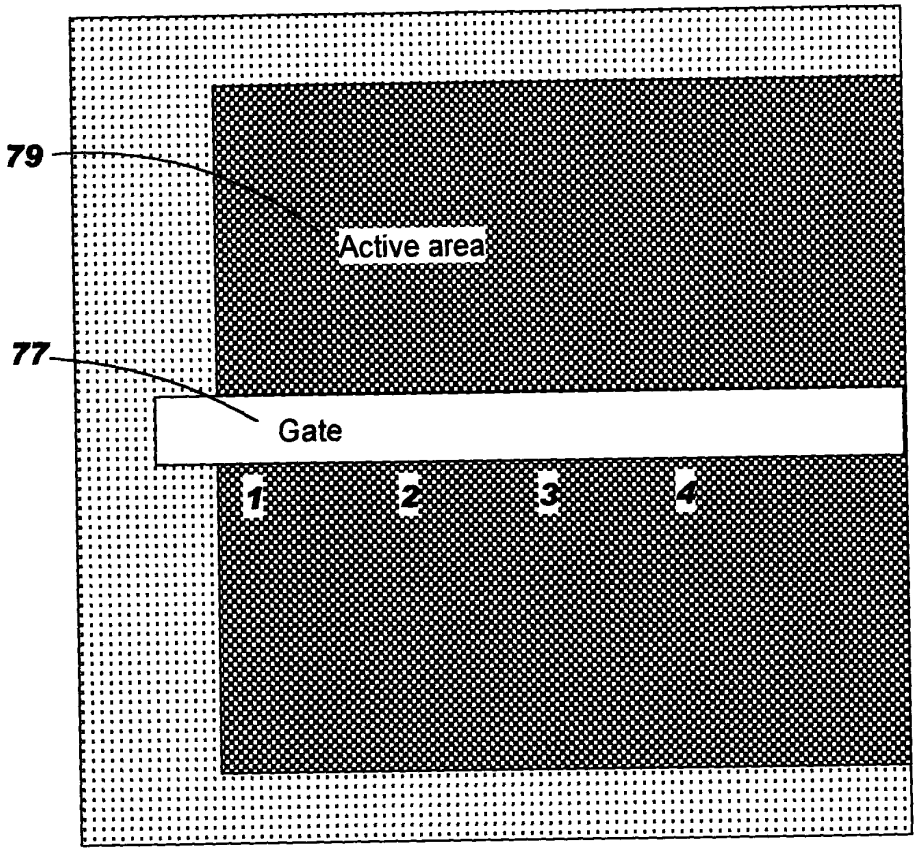
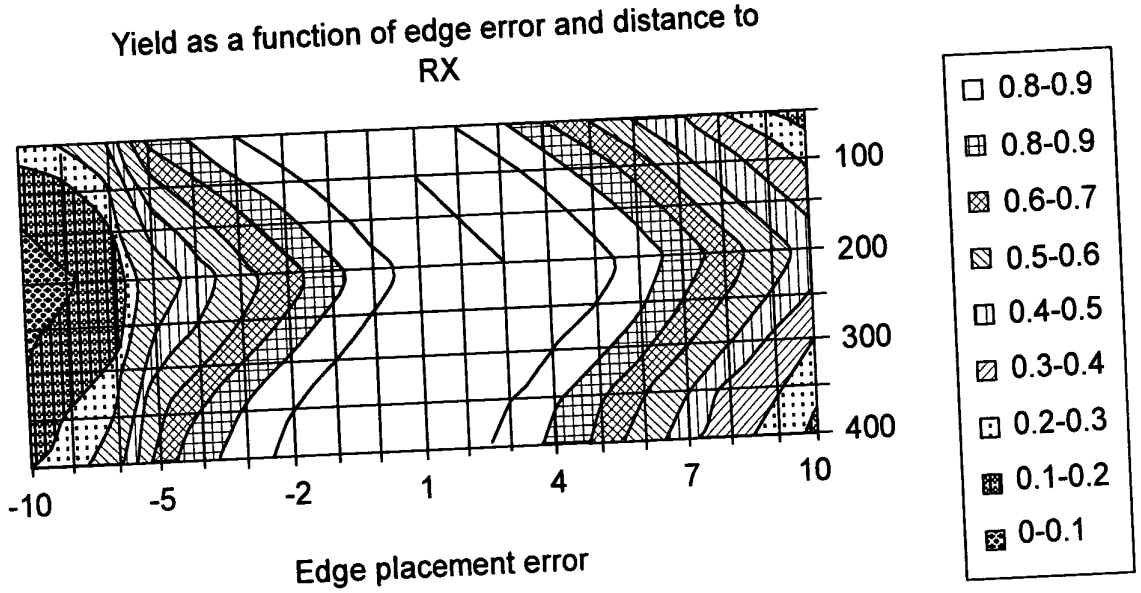


FIG. 8


Yield as a function of edge error and distance to RX
100
200
300
400
-10
-5
-2
1
4
7
10
Edge placement error
0.8-0.9
0.8-0.9
0.6-0.7
0.5-0.6
0.4-0.5
0.3-0.4
0.2-0.3
0.1-0.2
0-0.1

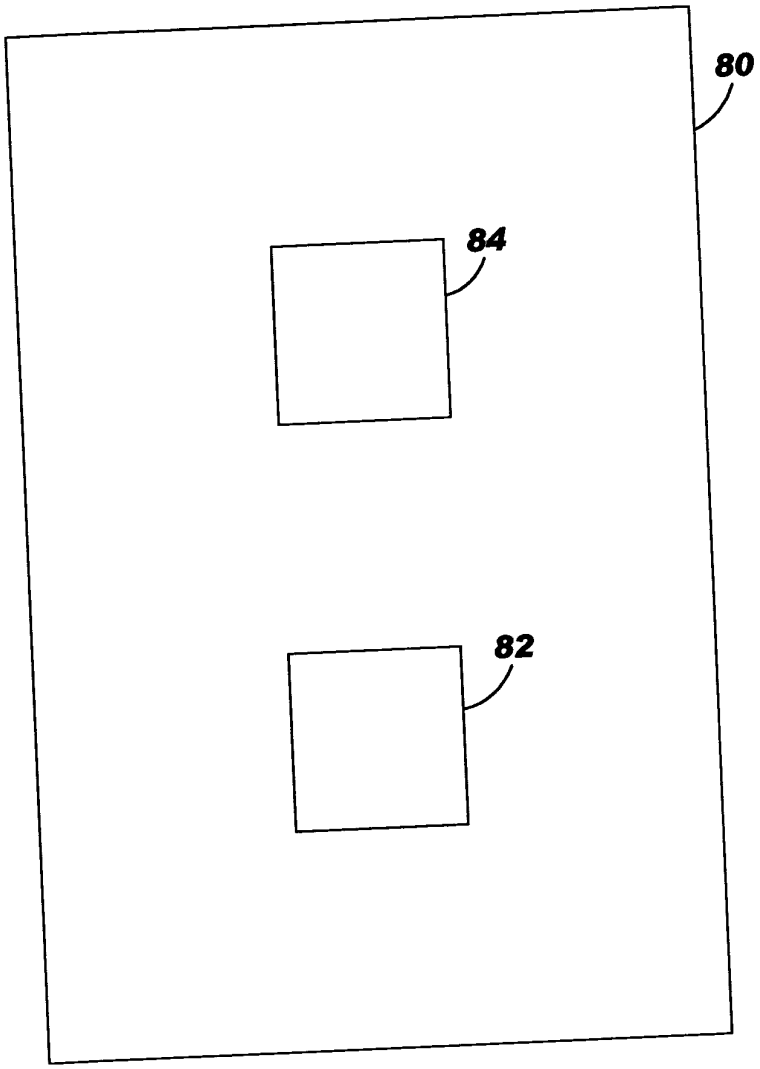



FIG. 9